

## Specifications for calibration gas for CO<sub>2</sub> measurement system

5% carbon dioxide, 21% oxygen, balance nitrogen

Cylinder size: BD

Method of preparation: gravimetric

Accuracy: 0.03% absolute

Moisture: 10 ppm maximum

Expiration period: 2 years

Pressure: 144 psig;

Volume: 11 liters

Certificate of analysis

Fitting included

Product code: 0304653SRO BD

Manufactured by: Scott Medical  
6141 Easton Rd.,  
Plumsteadville PA 18949  
(800) 233-4334, (215) 766-8861,  
FAX: (215) 766-7250

## Calibration check from measuring mode for Microstream® EtCO<sub>2</sub> monitors

To ensure monitor reading accuracy, a calibration check needs to be performed periodically during the year. Be sure that the FilterLine® CO<sub>2</sub> sampling line is connected to the monitor before starting Calibration Check.

Figure 1

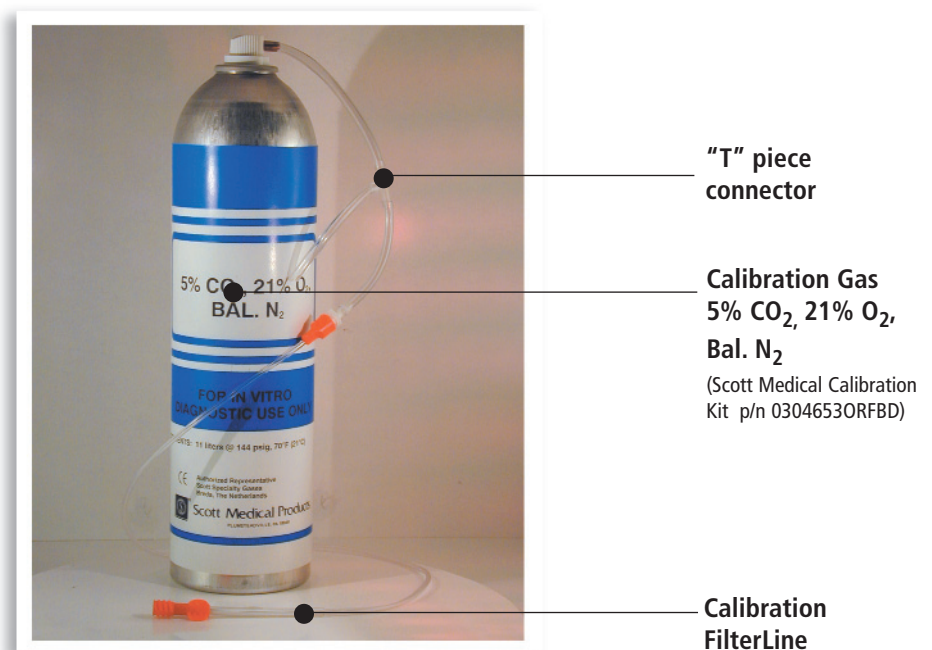
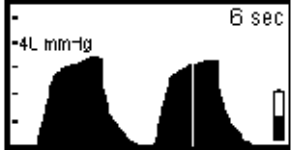
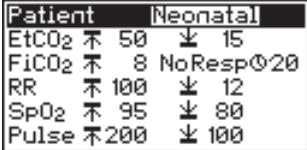
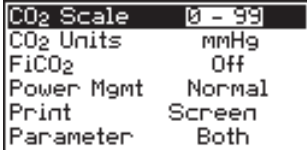
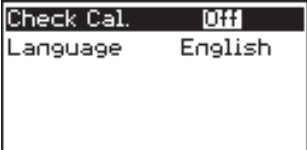
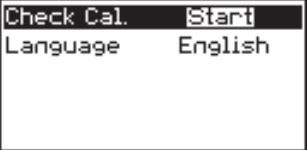


Figure 2



# Calibration

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| Objective                   | Action                                                                                                                                                                                                                                                                                                      | Response                                                                                                                                                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. To access Cal Check Mode | <p>Long press</p>  <p>Long press</p>  <p>Long press</p>  |         |
| 2. To start Check Cal       | <p>Press</p>  <p>Short press</p>  <p>No action required</p>                                                                            |    |
| 3. Prepare for Cal Check    | Connect the FilterLine® to the Calibration Gas (See figure 2)                                                                                                                                                                                                                                               |                                                                                        |
| 4. Proceed with Cal Check   | Press and hold the gas valve until the readings stabilize (approximately 15-20 seconds)                                                                                                                                                                                                                     |                                                                                        |

# Calibration

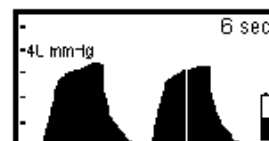
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| Objective | Action | Response |
|-----------|--------|----------|
|-----------|--------|----------|

**Calibration is not required if the measured value is the same as the concentration of the calibration gas ( $\pm 0.3$  Vol%) e.g. Concentration of calibration gas used is 5% ( $\text{CO}_2$ ); the measured value should be between 4.7%-5.3%, therefore, calibration is not required.**

5. To reset and return to measuring mode  
(Automatically erasing event messages)

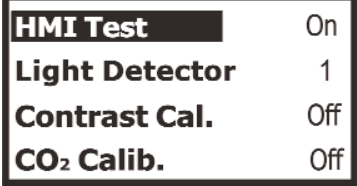
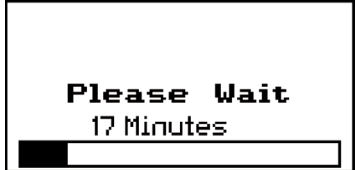
Long Press



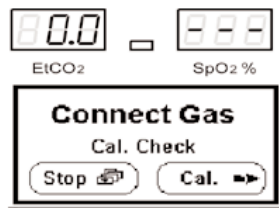
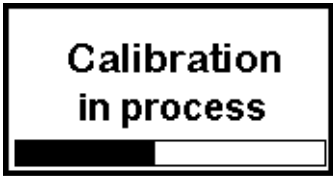
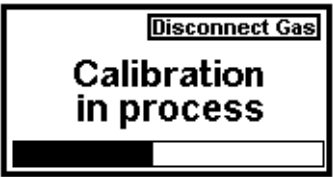
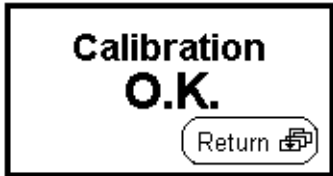
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## CO<sub>2</sub> Calibration

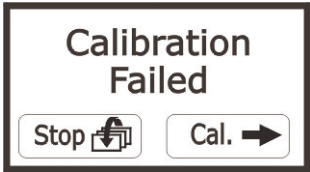
In order to ensure monitor reading accuracy, a calibration needs to be performed once a year or whenever the message **Calibration Required** appears on the monitor screen.

| Objective                                | Action                                                                                                                                                                                                                                                                | Response                                                                                                                                                                                                                                                                                                    |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------|------|---|--|--|---|--|--|---|--|--|---|--|--|---|--|--|
| 1. To access Service Mode                | During self-test, long press simultaneously<br> <br>and hold until the Service Mode screen appears. | <br><br>                                           |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 2. To access CO <sub>2</sub> Calibration | Long press<br>                                                                                                                                                                       | <table border="1"> <thead> <tr> <th></th><th>Events</th><th>Time</th></tr> </thead> <tbody> <tr><td>1</td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td></tr> </tbody> </table> |  | Events | Time | 1 |  |  | 2 |  |  | 3 |  |  | 4 |  |  | 5 |  |  |
|                                          | Events                                                                                                                                                                                                                                                                | Time                                                                                                                                                                                                                                                                                                        |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 1                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                             |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 2                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                             |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 3                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                             |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 4                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                             |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 5                                        |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                             |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
|                                          | Long press<br>                                                                                                                                                                     |                                                                                                                                                                                                                        |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
|                                          | Short press 3X<br>                                                                                                                                                                 |                                                                                                                                                                                                                        |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 3. Change option to Start                | Short press<br>                                                                                                                                                                    |                                                                                                                                                                                                                        |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |
| 4. Start Calibration process             | Short press<br>                                                                                                                                                                    |                                                                                                                                                                                                                        |  |        |      |   |  |  |   |  |  |   |  |  |   |  |  |   |  |  |

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| Objective                                             | Action                                                                                                                                                                      | Response                                                                              |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                       | No action required                                                                                                                                                          |    |
| 5. Activating calibration                             | Connect the FilterLine® to the Calibration Gas (See figure 2)                                                                                                               |    |
|                                                       | Press and hold the gas valve<br>Short press<br>                                           |   |
|                                                       | No action required                                                                                                                                                          |  |
|                                                       | Continue pressing the gas valve until the Disconnect Gas message appears.<br><br>Disconnect Gas from the FilterLine®<br>(do not disconnect the FilterLine from the monitor) |  |
|                                                       | Wait approximately 15-20 seconds                                                                                                                                            |  |
| 6. Calibration succeeded and return to measuring mode | Long press<br>                                                                           |                                                                                       |

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| Objective                    | Action                                                                                                                          | Response                                                                            |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>If calibration failed</b> |                                                                                                                                 |                                                                                     |
| 1.                           | Check connection and restart<br>Long press<br> |  |
| 2.                           | Contact your local sales representative                                                                                         |  |

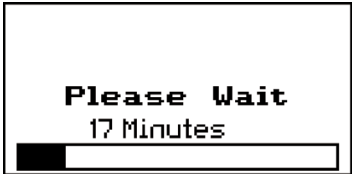
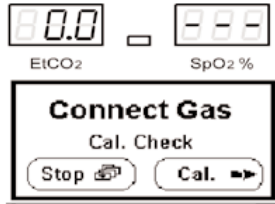
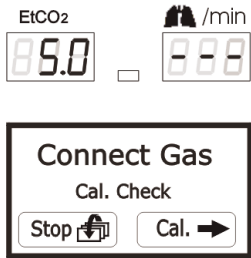
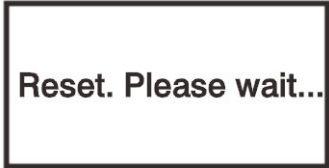
## CO<sub>2</sub> Calibration Check from Service Mode for Microstream® Handhelds

In order to ensure accuracy, a CO<sub>2</sub> calibration check needs to be done periodically. Calibration gas and a FilterLine® are needed for this procedure.

| Objective                                | Action                                                                                                                                                                                                                                                                | Response                                                                                                                                                                                                                                                          |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. To access Service Mode                | During self-test, long press simultaneously<br> <br>and hold until the Service Mode screen appears. | <br><br> |
| 2. To access CO <sub>2</sub> Calibration | Long press<br>                                                                                                                                                                     |                                                                                                                                                                               |
|                                          | Long press<br>                                                                                                                                                                     |                                                                                                                                                                              |
|                                          | Short press 3X<br>                                                                                                                                                                 |                                                                                                                                                                              |

# Calibration

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| Objective                                                                          | Action                                                                                            | Response                                                                              |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 3. Change option to Start                                                          | Short press<br>  |    |
| 4. Start Cal Check process                                                         | Short press<br>  |    |
|                                                                                    | No action required                                                                                |    |
| 5. Prepare for Cal Check                                                           | Connect the FilterLine® to the Calibration Gas (See figure 2)                                     |  |
| 6. Proceed with Cal Check                                                          | Press and hold the gas valve until the readings stabilize (approximately 15-20 seconds)           |  |
| 7. To reset and return to measuring mode<br>(Automatically erasing event messages) | Long Press<br> |  |

## Capnostream™ – CO<sub>2</sub> Calibration Check

Depending on institutional policy and procedure, the monitor can be checked at any time to determine if the CO<sub>2</sub> detection is within the accepted limits. The Calibration Check Procedure below gives the step-by-step instructions to perform a Calibration Check.

**Caution:** *The calibration check must be performed with a manufacturer authorized Calibration Kit containing a gas mixture of 5% CO<sub>2</sub> 21% O<sub>2</sub> and Bal N<sub>2</sub> and the authorized connecting means ("T" piece).*

A manufacturer approved Calibration Kit can be purchased from Scott Medical (part number 0304653ORFBD) consisting of:

- Calibration Gas containing 5% CO<sub>2</sub>, 21% O<sub>2</sub> Bal N<sub>2</sub>
- Tubing Adapter ("T" Piece)
- Calibration Line (Short Calibration FilterLine®)

**Note:** If this process is performed while a battery powers the monitor, make sure that the battery is fully charged.

Prior to checking the calibration, verify that the Calibration Line supplied with the Calibration Kit is firmly attached.

Calibration Check Procedure

**Note:** At any stage in the Calibration Check procedure, you can go BACK to the first screen.

## Steps

1. Use the control knob to navigate to the CO<sub>2</sub> CALIBRATION CHECK screen. From the HOME screen select the SYSTEM menu and then select CAL CHECK. Or, from the SERVICE screen select CO<sub>2</sub> CAL and then select CAL CHECK.

The CO<sub>2</sub> CALIBRATION CHECK screen is displayed. On-screen instructions will guide you through a number of Calibration Check steps.

2. The screen displays the message: "CONNECT FILTERLINE TO MONITOR". Connect the Calibration Line to the monitor and select START to start the calibration check.
3. The screen displays the message: "CONNECT CALIBRATION GAS [5% CO<sub>2</sub> 21% O<sub>2</sub> BALANCE N<sub>2</sub>]". Connect the other end of the Calibration Line to the gas canister, then select CONTINUE.
4. The screen displays the message: "OPEN GAS SUPPLY FROM CYLINDER". Open the gas canister and select CONTINUE.

At this time, the module performs a calibration check. While doing so, it displays a message "CALIBRATION CHECK IN PROGRESS". If the CO<sub>2</sub> Module is still warming up, the monitor displays a message "NOT READY TO CALIBRATE". Wait until module is ready and then select CONTINUE.

5. When the module has completed the calibration check measurements and is processing data, it displays the message:

"CALCULATING RESULTS, GAS SUPPLY MAY BE CLOSED."

6. Close the calibration check gas supply. If you have to stop the calibration check, use the control knob to select STOP.

**Steps continued.**

7. The screen displays the message: “DISCONNECT CALIBRATION GAS AND FILTERLINE” and CONTINUE.

The module then displays:

CALIBRATION CHECK COMPLETE

MEASURED CO<sub>2</sub> X.X%

ACCURACY SPECIFICATION FOR A 5% GAS IS 4.7–5.3%.

Select BACK to return to the HOME screen, or START to perform the calibration check again.

If the calibration check result indicates that the monitor is out of calibration, then the message “MEASURED CO<sub>2</sub> NOT WITHIN SPECIFICATIONS. CALIBRATION RECOMMENDED” is displayed. In this case, the Calibration Procedure needs to be performed. Refer to the Service Manual or to authorized Oridion Service personnel.

If the monitor is unable to complete the calibration check, a “CALIBRATION FAILED” message appears with one of the following error messages:

- “FILTERLINE NOT CONNECTED”
  - “CALIBRATION FAILED: NO GAS, WRONG GAS CONCENTRATION, OR UNSTABLE GAS”
  - “MEASUREMENT ERROR; CHECK ALL CONNECTIONS AND TRY AGAIN”
  - “CALIBRATION ABORTED BY USER”
- “CO<sub>2</sub> MODULE INTERNAL SELF-TEST FAILED”

**Oridion®**[www.oridion.com](http://www.oridion.com)